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DOUBLE SHOT SPEAKER TAB TO MITIGATE SPEAKER RATTLING

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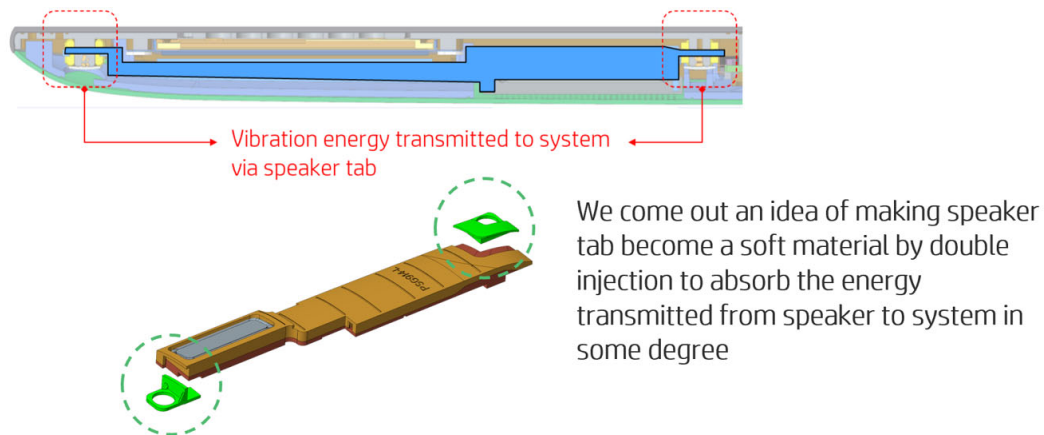
Double Shot Speaker Tab to mitigate speaker rattling

Objectives

This design is to double-shot the soft material (EL250 or EM400) onto the speaker chassis, and the soft material could be used as an elastic tab mounted to system to absorb the damping energy when vibration

Problem Solved

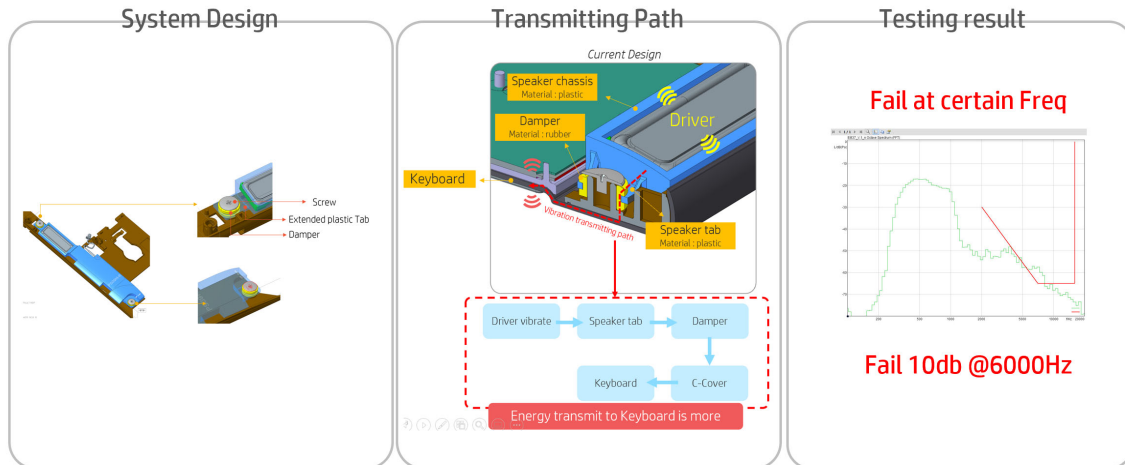
Root Cause – Energy transmitting



The green part of picture above (Material Name: EL250 & EM400) is a soft material that are double injected onto speaker as screw datum to system so as to absorb the vibration energy when playing sound

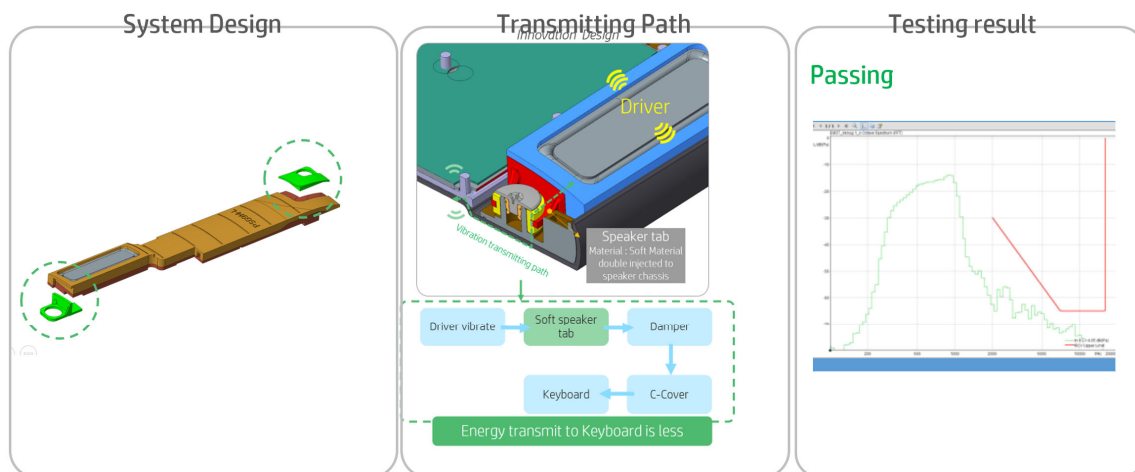
Prior Solutions

Previous design was using damper + extended plastic tab + screw, but this solution is not solid, speaker still have chance to transmit energy to system C-Cover, and system cover will cause KB or other part to rattle, thus generating sound. The transmitting path, section, rattling result is shown below



Description of invention

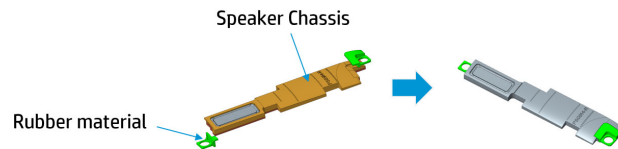
We come out an idea of making speaker tab become a soft material by double injection to absorb the energy transmitted from speaker to system. The transmitting path is optimized, and the energy will be intercepted right in the double injection arm rather than the damper that is applied to system cover



Process

1. Molding speaker plastic chassis (without tab) with material ABS 406e as is often used
2. Put speaker plastic chassis into double shot tool
3. Molding rubber material (EM400/EL250) to be formed as tabs

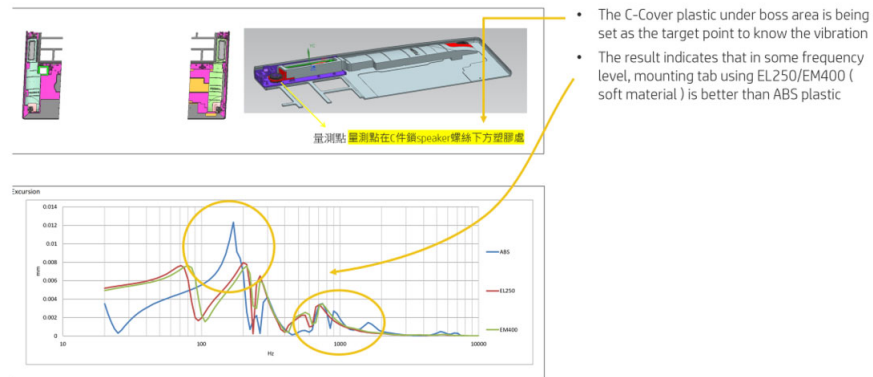
Tab material	EL250 (DSM)	EM400 (DSM)
Young's modulus	25Mpa	40 MPa
Density	1080 kg/m3	1110kg/m3



4. Assemble speaker with rubber tab to system.
5. Assemble screw

Advantages

Using molded rubber design will have better damping result as this design intercepts vibration right away when energy transfer to system boss, the simulating result prove concept positive



Concept mock-up



Disclosed by David So, Richard Chang and Danny Tseng, HP Inc.